

Parupkaar.org

MAJOR PROJECT REPORT

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF THE DEGREE OF

BACHELOR OF TECHNOLOGY
(Computer Science and Engineering)



Submitted by:

Jagjeet Singh
D4IT 2014-18
146040
1411266

Amritpal Singh
D4IT 2014-18
146008
1411234

Guru Nanak Dev Engineering College
Ludhiana 141006

Abstract

This project mainly discuss about OpenStreetMap. Geographical data (geo data) is not free in many parts of the world. Generally these places have given the task of mapping to various government agencies who in return get to make money by selling the data back to you and me.

The main disadvantage of Google Maps is that data is copyrighted and owned by multiple organisations like the Ordnance Survey. Google/whoever just licenses it. If we were to use it, we'd have to pay for it. This leads to the increasing demand of OSM.

You can use OSM by picking an area that you know well and use the OpenStreetMap viewer to see how well the map data corresponds to your own knowledge. As on Wikipedia, it's easy to edit, so you can help!.

Also, this project is completely open source and the entire code is available to the user as and when required. There is Complete developer's Blog reference alongwith it that helps using it a lot easier. The data and software is owned by you, the contributors.

There is an organisation called the OpenStreetMap Foundation which exists to protect, promote, and support the project, but does not own the data. There are lots of ways to contribute to the OpenStreetMap project.

Acknowledgement

We, students of Guru Nanak Dev Engineering College, Ludhiana, have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincere thanks to all of them.

The authors are highly grateful to Dr. Sehijpal Singh Principal, Guru Nanak Dev Engineering College, Ludhiana for providing them with the opportunity to carry out their Major project.

The author would like to wholeheartedly thank DR. Kiran Jyoti, Assistant Professor, at Guru Nanak Dev Engineering College, Ludhiana who is a vast sea of knowledge and without whose constant and never ending support and motivation, it would never have been possible to complete the project and other assignments so efficiently and effectively.

Jagjeet Singh & Amritpal Singh & Abhinav Handa & Harnarinder Singh

1	Introduction	2
1.1	Overview	2
1.2	Software Requirement Specification	3
1.2.1	Functional Requirements	3
1.2.2	Performance Requirement	3
1.2.3	Dependability Requirement	3
1.2.4	Non-functional requirements	4
2	FeasibilityStudy	5
2.1	Overview	5
2.2	The Existing System	5
2.3	User Requirement Analysis	6
2.4	Feasibilty Study	7
2.4.1	Tyes of Feasibility Study	8
2.4.1.1	Technical Feasibility	8
2.4.1.2	Economic Feasibility	9
2.4.1.3	Behavioral Feasibility	11
2.5	Objective of Project	12
2.6	Significance of Project	13
2.7	Objectives of the Project	13
3	PLANNING OF WORK	14
3.1	Steps of Implementation	14
4	Facilities Required for Proposed Work	16
4.1	Software Requirements	16

LIST OF FIGURES

1.1	Parupkaar.org logo	2
3.1	14

1.1 Overview



Figure 1.1: Parupkaar.org logo

parupkaar.org is an non-profit organization with the aim to provide volunteers to help anyone. We will provide a platform where altruist meets the needy. Our main motive is to help the masses without any inconsiderate motives.

Everyone who wishes to contribute something towards the humanity is our intended audience. We wish to give a chance to anyone who wants to help any NGO but doesnt know how to do so. Also, the people who cant donate something but wish to be a volunteer is our intended audience.

An open-source project is basically a map where volunteers will get own profile and the people who wants to donate anything but dont have time to do so, can help via volunteers. Volunteers will be live on map and can reach out to public in there area to donate whatever they can and help needy ones. Once well established the project has scope to help people at international level.

Parupkaar.org will let volunteers create their profile and will connect them to others. By letting people see location of volunteers in a particular area, a connection will be established so that needy people can be helped.

1.2 Software Requirement Specification

The main requirement is to somehow parallelize the evaluation of nodes in the node tree. This can be achieved by either taking a multithreading approach or having two separate processes for compile and render itself. The major concern is the non thread safety of CGAL library which needs to be accounted for. Another follow up requirement is to add a cancel mechanism to any ongoing render process without losing context on already evaluated nodes in the tree.

1.2.1 Functional Requirements

- Parallel processing of Nodes.
- Maintaining thread safety of CGAL.
- Sustaining caching of previously evaluated nodes to improve speed during repeated renders of the model.
- Introducing a halt mechanism on ongoing render processes.
- Safe exit from compilation.
- Warning in case of multiple pseudo root node tags.
- Error detection of unclosed multiple comments, use and include tags and double quotes used for representing strings.

1.2.2 Performance Requirement

- Improvement in time consumption during rendering.
- Efficient use of processor resources.
- Less CPU idle time.

1.2.3 Dependability Requirement

- All previously supported OS must also be supported after additional changes and features.
- Libraries used must be cross platform in nature.
- Thread safety must be maintained across all operating system. The interface for threads used must be OS independent.

1.2.4 Non-functional requirements

1. Extensible: It should be able to support future functional requirements
2. Usability: Simple user interfaces that a layman can understand.
3. Modular Structure: The software should have structure. So, that different parts of software would be changed without affecting other parts.
4. Backward compatibility: Addition of new syntax should not forbid script to work correctly on the backward versions of OpenSCAD.

2.1 Overview

OpenStreetMap (OSM) is an open-source, free web-based software, owned by you, the contributors. OpenStreetMap is an online open data platform to collect the world's geographic data based on the Wikipedia model of crowdsourcing. The project started in 2004 by Steve Coast and is now governed by the non profit OpenStreetMap Foundation based in the UK.

OpenStreetMap is a free editable map of the whole world. It is made by people like you. Which means the database will always be subject to the whims, experimentation, and mistakes of the community. This is precisely OSMs strength since, among other things, it allows our data to quickly accommodate changes in the physical world.

By making your system an OSM tile server not only you can edit the map but can use it offline also. You can change the styling of the map like color of the roads fonts style and amny more as per your requirments.

The core part of OSM is implemented using Mapnik library and database for rendering, mod_tile and slippy for web interface. Bash Shell Scripting has been used to automate the installation.

My training being not based on particular language or technology, different type of open-source softwares and technologies are used in this project and many during my training which are not used in this project like CGI (for web interface through c++).

2.2 The Existing System

Right now, there is no online platform which can show all the live volunteers in a area and people who provide the same service usually charge some money to the NGOs. We are going to provide a platform where people can openly contribute either as a volunteer or donator.

Geographical data (geo data) is not free in many parts of the world. If you collect data from Google Maps in this way, you are creating a "derived work". Any such data retains the copyright conditions of the original. In practice, this means your data is subject to the licensing fees, and contractual restrictions, of these map providers. That's exactly what OpenStreetMap is trying to avoid. The data is copyrighted and owned by multiple organisations like the Ordnance Survey. Google/whoever just licenses it. If we were to use it, we'd have to pay for it.

In areas where there are no such data sources (most areas) we have to start from a blank slate, and head out there to survey the streets ourselves. Despite starting from scratch, we have achieved a good level of completion in many places.

"Also, you may not use Google Maps in a manner which gives you or any other person access to mass downloads or bulk feeds of numerical latitude and longitude coordinates."

Limitations of existing system

- We can't edit the maps.
- Data may be inaccurate.
- They are costly.
- Can't create own map server.
- Mass downloads or bulk feeds of numerical latitude and longitude coordinates is sometime impossible.

2.3 User Requirement Analysis

For User Requirement Analysis, users of this system have been asked about possible requirements that this software should have and we got following resultant list of outputs:-

1. A full editing history is stored for each user.
2. Provide on-line way to analysis so that individual does not have to install anything.
3. Users can attach Wikipedia-like edit summaries to their edits, and there is a History tab on the main page that shows recent edits to the selected area.
4. Make it work like batch mode. so, that user can give inputs together like shell scripting.
5. The user can download the data in *.pbf or *.osm file format.
6. There is a help centre at help.openstreetmap.org.
7. Both technical and non-technical users can use OSM.

8. User can make own OSM tile server.
9. User can run script for automatic installation.
10. Reduce the time for analysis.
11. To view the map on web browser.
12. To change the styling of the map on own tile server according to his desire.

2.4 Feasibility Study

This review is made to see if the project on completion will serve the purpose of the organization for the amount of work, effort and the time that spend on it. Feasibility study lets the developer foresee the future of the project and the usefulness. A feasibility study of a system proposal is according to its workability, which is the impact on the organization, ability to meet their user needs and effective use of resources. Carrying out a feasibility study involves information assessment, information collection and report writing. The information assessment phase identifies the information that is required to answer the three questions set out above. Once the information has been identified, you should question information sources to discover the answers to these questions Thus when a new application is proposed it normally goes through a feasibility study before it is approved for development.

A feasibility study is designed to provide an overview of the primary issues related to a business idea. The purpose is to identify any make or break issues that would prevent your business from being successful in the marketplace.

The document provide the feasibility of the project that is being designed and lists various areas that were considered very carefully during the feasibility study of this project such as Technical, Economic and Operational feasibilities. Feasibility is defined as the practical extent to which a project can be performed successfully. To evaluate feasibility, a feasibility study is performed, which determines whether the solution considered to accomplish the requirements is practical and workable in the software.

Objectives of feasibility study are listed below:

- To analyze whether the software will meet organizational requirements.

- To determine whether the software can be implemented using the current technology and within the specified budget and schedule.
- To determine whether the software can be integrated with other existing software.

2.4.1 Tyes of Feasibility Study

Various types of feasibility that are commonly considered include technical feasibility, economic feasibility, and behavioural feasibility.

2.4.1.1 Technical Feasibility

Technical feasibility is one of the first studies that must be conducted after the project has been identified. In large engineering projects consulting agencies that have large staffs of engineers and technicians conduct technical studies dealing with the projects. In individual agricultural projects financed by local agricultural credit corporations, the technical staff composed of specialized agricultural engineers, irrigation and construction engineers, and other technicians are responsible for conducting such feasibility studies.

The Technical feasibility assessment is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system. This assessment is based on an outline design of system requirements, to determine whether the company has the technical expertise to handle completion of the project. When writing a feasibility report, the following should be taken to consideration:

- A brief description of the business to assess more possible factors which could affect the study
- The part of the business being examined
- The human and economic factor
- The possible solutions to the problem

The system must be evaluated from the technical point of view first. The assessment of this feasibility must be based on an outline design of the system requirement in the terms of input, output, programs and procedures. Having identified an outline system, the investigation must go on to suggest the type of equipment, required method developing the system, of running the system once it has been designed. Technical feasibility assesses the current resources (such as hardware and software) and technology, which are required to accomplish user requirements in the software within the allocated time and budget. For this, the software development

team ascertains whether the current resources and technology can be upgraded or added in the software to accomplish specified user requirements. A Technical feasibility also performs the following tasks.

- Analyzes the technical skills and capabilities of the software development team members
- Determines whether the relevant technology is stable and established
- Ascertains that the technology chosen for software development has a large number of users so that they can be consulted when problems arise or improvements are required.

Technical issues raised during the investigation are:

- Does the existing technology sufficient for the suggested one?
- Can the system expand if developed?

The project should be developed such that the necessary functions and performance are achieved within the constraints. The project is developed within latest technology. Through the technology may become obsolete after some period of time, due to the fact that never version of same software supports older versions, the system may still be used. So there are minimal constraints involved with this project. The system has been developed using Java the project is technically feasible for development.

OpenStreetMap is technically feasible as it is built up using various open source technologies and it can run on any platform.

2.4.1.2 Economic Feasibility

The purpose of the economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification of all the benefits expected. This assessment typically involves a cost/ benefits analysis.

Economic feasibility is the cost and logistical outlook for a business project or endeavor. Prior to embarking on a new venture, most businesses conduct an economic feasibility study, which is a study that analyzes data to determine whether the cost of the prospective new venture will ultimately be profitable to the company. Economic feasibility is sometimes determined within an organization, while other times companies hire an external company that specializes in conducting economic feasibility studies for them.

The purpose of business in a capitalist society is to turn a profit, or to earn positive income. While some ideas seem excellent when they are first presented, they are not always economically feasible. That is, that they are not always profitable or even possible within a company's budget. Since companies often determine their budget's several months in advance, it is necessary to know how much of the budget needs to be set aside for future projects. Economic feasibility helps companies determine what that dollar amount is before a project is ultimately approved. This allows companies to carefully manage their money to insure the most profitable projects are undertaken. Economic feasibility also helps companies determine whether or not revisions to a project that at first seems unfeasible will make it feasible.

The developing system must be justified by cost and benefit. Criteria to ensure that effort is concentrated on project, which will give best, return at the earliest. One of the factors, which affect the development of a new system, is the cost it would require. Economic feasibility determines whether the required software is capable of generating financial gains for an organization. It involves the cost incurred on the software development team, estimated cost of hardware and software, cost of performing feasibility study, and so on. For this, it is essential to consider expenses made on purchases (such as hardware purchase) and activities required to carry out software development. In addition, it is necessary to consider the benefits that can be achieved by developing the software. Software is said to be economically feasible if it focuses on the issues listed below.

- Cost incurred on software development to produce long-term gains for an organization.
- Cost required to conduct full software investigation (such as requirements elicitation and requirements analysis).
- Cost of hardware, software, development team, and training.

The following are some of the important financial questions asked during preliminary investigation:

- The costs conduct a full system investigation.
- The cost of the hardware and software.
- The benefits in the form of reduced costs or fewer costly errors.

Since the system is developed as part of project work, there is no manual cost to spend for the proposed system. Also all the resources are already available, it give an indication of the system is economically possible for development.

2.4.1.3 Behavioral Feasibility

Behavioral feasibility assesses the extent to which the required software performs a series of steps to solve business problems and user requirements. It is a measure of how well the solution of problems or a specific alternative solution will work in the organization. It is also measure of how people feel about the system. If the system is not easy to operate, than operational process would be difficult. The operator of the system should be given proper training. The system should be made such that the user can interface the system without any problem.

Operational feasibility is a measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development. The operational feasibility assessment focuses on the degree to which the proposed development projects fits in with the existing business environment and objectives with regard to development schedule, delivery date, corporate culture, and existing business processes.

To ensure success, desired operational outcomes must be imparted during design and development. These include such design-dependent parameters such as reliability, maintainability, supportability, usability, producibility, disposability, sustainability, affordability and others. These parameters are required to be considered at the early stages of design if desired operational behaviors are to be realized. A system design and development requires appropriate and timely application of engineering and management efforts to meet the previously mentioned parameters. A system may serve its intended purpose most effectively when its technical and operating characteristics are engineered into the design. Therefore, operational feasibility is a critical aspect of systems engineering that needs to be an integral part of the early design phases. This feasibility is dependent on human resources (software development team) and involves visualizing whether the software will operate after it is developed and be operative once it is installed. Operational feasibility also performs the following tasks.

- Determines whether the problems anticipated in user requirements are of high priority.
- Determines whether the solution suggested by the software development team is acceptable.
- Analyzes whether users will adapt to a new software.

- Determines whether the organization is satisfied by the alternative solutions proposed by the software development team.

This includes the following questions:

- Is there sufficient support for the users?
- Will the proposed system cause harm?
- The project would be beneficial because it satisfies the objectives when developed and installed. All behavioral aspects are considered carefully and conclude that the project is behaviorally feasible.

2.5 Objective of Project

OpenStreetMap is an online open data platform to collect the world's geographic data based on the Wikipedia model of crowdsourcing. The project started in 2004 by Steve Coast and is now governed by the non profit OpenStreetMap Foundation based in the UK. The main objectives of this project is to -:

1. To inspire the students to contribute on open source projects like OSM.
2. A full editing history is stored for each user.
3. Provide on-line way to analysis so that individual does not have to install anything.
4. Users can attach Wikipedia-like edit summaries to their edits, and there is a History tab on the main page that shows recent edits to the selected area.
5. Make it work like batch mode. so, that user can give inputs together like shell scripting.
6. The user can download the data in *.pbf or *.osm file format.
7. There is a help centre at help.openstreetmap.org.
8. Both techinal and non-technical users can use OSM.
9. User can make own OSM tile server.
10. User can run script for automatic installation.
11. Reduce the time for analysis.
12. To view the map on web browser.
13. To change the styling of the map on own tile server according to his desire.

2.6 Significance of Project

Speed, concurrency, efficiency and better management of resources go a long way in improving any products' performance, usability and popularity. The same can certainly be said about an open source project like OpenStreetMap. Our project will explore above aspects for OpenStreetMap.

2.7 Objectives of the Project

Objective of this project are following:

- Parupkaar.org will let volunteers create their profile and will connect them to others. By letting people see location of volunteers in a particular area, a connection will be established so that needy people can be helped.
- Everyone who feels like helping others will use our product, volunteers who wish to act as a medium between donator and needy
- Others will be the donators themselves, who wish to help in any kind. Also other N.G.O's can be contacted to widen the users.

CHAPTER 3

PLANNING OF WORK

The basic implementation of this project will be done using prototype model and their will also be need to modify the structure of the project. Final flow of project will be fig. 3.1

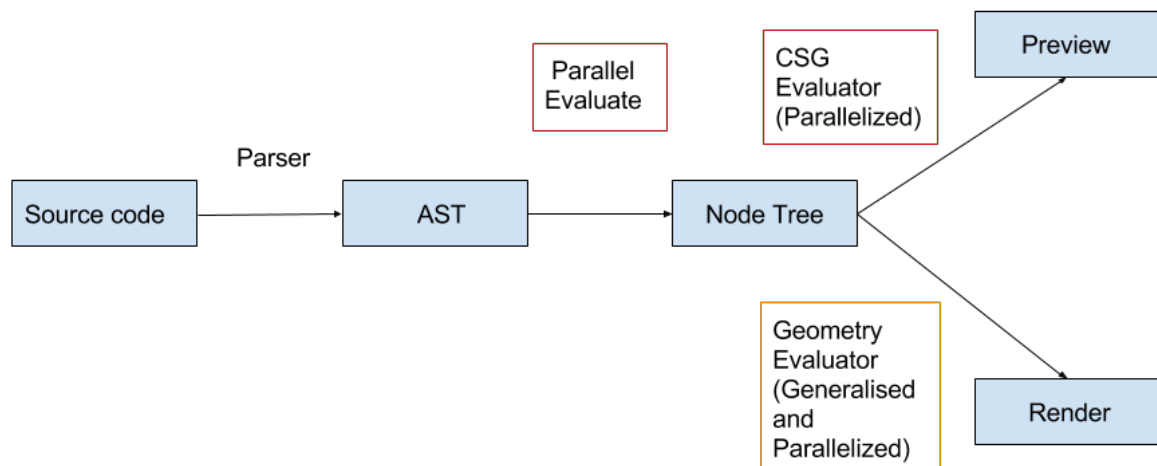


Figure 3.1:

3.1 Steps of Implementation

- The first thing that needs to be done is configure Map tile and osm data with django framework.

- After that we need to let any volunteer create a unique profile which will be shown on map.
- Routing will come into action after profile is created. Routing will connect volunteers to donators.
- After going through all of this our objective will be meet.

CHAPTER 4

FACILITIES REQUIRED FOR PROPOSED WORK

4.1 Software Requirements

The following softwares may be used while developing and testing the software:

1. OSM4.4 → 5.x (<https://www.openstreetmap.org/>)
2. Leaflet (2.7 →)(<http://leafletjs.com/>)
3. Django (3.6 →) (<https://www.djangoproject.com/>)
4. Python (5.x) (<https://www.python.org/>)

- [1] L^AT_EX Beginner's Guide By Stefan Kottwitz, <https://www.packtpub.com/hardware-and-creative/latex-beginners-guide>
- [2] L^AT_EX, <https://www.sharelatex.com>
- [3] Installation Guide, <https://switch2osm.org/serving-tiles/manually-building-a-tile-server-14-04/>
- [4] OSM, <http://wiki.openstreetmap.org/wiki/FAQ>
- [5] leaflet, <http://leafletjs.com/>
- [6] django, <https://www.djangoproject.com>
- [7] IRC Channel, <https://webchat.freenode.net/>
- [8] Git and Github, rogerdudler.github.io/git-guide/
- [9] Github Profile, <https://github.com/iamjagjeetubhi>
- [10] Github Profile, <https://github.com/amrit3701>
- [11] Github Profile, <https://github.com/abhinavhanda21>
- [12] Server, jagjeet.me
- [13] Online Sources